

IN THE CLAIMS

Please amend the claims as follows:

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Claim 1 (Currently Amended): An image reading apparatus comprising:

a photoelectric transducer configured to read an image of a document and to output an analog image signal;

an A/D converter configured to input the analog image signal and output a corresponding digital image signal;

an offset level detecting circuit configured to seek an average value of output levels from picture elements in a predetermined number of lines of image data taken from range of the photoelectric transducer;

an offset setting unit configured to provide an offset in the analog image signal before the A/D conversion on the basis of the average value;

a first comparing device configured to compare the average value to a predetermined target value; and

an adjusting device configured to adjust ~~a size of the predetermined range of~~ predetermined number of lines of image data taken from the photoelectric transducer on the basis of a result of the comparison.

Claim 2 (Currently Amended): The image reading apparatus of claim 1, wherein the adjusting device ~~enlarges~~ increase the predetermined ~~range of~~ number of lines of image data taken from the photoelectric transducer when a difference between the average value and the target value is smaller than a predetermined value.

Claim 3 (Currently Amended): The image reading apparatus of claim 2, wherein the first comparing device comprises a second comparing device configured to compare the difference between the average value and the target value to a first predetermined value which is previously set, and a third comparing device configured to compare the difference to a second predetermined value which is previously set and which is smaller than the first predetermined value,

02 and further wherein, the adjusting device repeats the adjustment until the second comparing device judges that the difference is less than the first predetermined value, and when the difference is less than the first predetermined value, the predetermined ~~range of~~ number of lines of image data taken from the photoelectric transducer is made a maximum, and the third comparing device compares the difference to the second predetermined value after the predetermined ~~range~~ number of lines of image data taken from is made maximum.

Claim 4 (Original): The image reading apparatus of claim 1, wherein the picture elements in the predetermined range of the photoelectric transducer are optical black picture elements of the photoelectric transducer.

Claim 5 (Currently Amended): A copying machine comprising:

an image reading apparatus including;

a photoelectric transducer configured to read an image of a document and to output an analog image signal;

an A/D converter configured to input the analog signal and output a corresponding digital image signal;

an offset level detecting circuit configured to seek an average value of output levels from picture elements in a predetermined ~~range of~~ number of lines of image data taken from the photoelectric transducer;

an offset setting unit configured to provide an offset in the analog image signal before the A/D conversion on the basis of the average value;

a first comparing unit configured to compare the average value to a predetermined target value; and

an adjusting device configured to adjust ~~a size of~~ the predetermined ~~range of~~ number of lines of image data taken from the photoelectric transducer on the basis of a result of the comparison; and

an image forming apparatus configured to form an image on the basis of image data of a document which is read by the image reading apparatus.

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Claim 6 (Currently Amended): An image reading apparatus comprising:

transducing means for reading an image of a document and for outputting an analog image signal;

A/D converting means for converting the analog signal to a digital image signal;

offset level detecting means for seeking an average value of output levels from picture elements of a predetermined ~~range of~~ number of lines of image data taken from the transducing means;

offset setting means for providing an offset in the analog image signal before the A/D conversion on the basis of the average value;

first comparing means for comparing the average value to a predetermined target value; and

adjusting means for adjusting ~~a size of~~ the predetermined ~~range of~~ number of lines of image data taken from the transducer means on the basis of a result of the comparison.

Claim 7 (Currently Amended): A method or image reading, comprising ~~steps of~~:  
reading an image of a document and outputting an analog image signal with a photoelectric transducer;  
converting the analog signal to a digital image signal;  
seeking an average value of output levels from picture elements of a predetermined ~~range of~~ number of lines of image data taken from the photoelectric transducer;  
setting offset in the analog image signal before the A/D conversion on the basis of the average value;  
comparing the average value to a predetermined target value as a first ~~step of~~ comparing; and  
adjusting ~~a size of~~ the predetermined ~~range of~~ number of lines of image data taken from the photoelectric transducer on the basis of a result of the comparison.

Claim 8 (Currently Amended): The method of claim 7, wherein the adjusting ~~step~~ comprises:

adjusting the predetermined ~~range of~~ number of lines of image data taken from the photoelectric transducer to be ~~larger~~ increased when a difference between the average value and the target value is smaller than a predetermined value.

Claim 9 (Currently Amended): The method of claim 8, wherein the first ~~step of~~ comparing ~~including a step of~~ includes comparing the difference between the average value and the target value to a first predetermined value which is previously set as a second ~~step of~~

comparing, and a ~~step of~~ comparing the difference to a second predetermined value which is previously set and is smaller than the first predetermined value as a third ~~step of~~ comparing,

and further wherein, the adjusting ~~step~~ repeats the adjustment until the second ~~step of~~ comparing judges that the difference is less than the first predetermined value, and when the difference is less than the first predetermined value, the predetermined ~~range of~~ number of lines of image data taken from the photoelectric transducer is made a maximum, and the third ~~step of~~ comparing compares the difference to the second predetermined value after the predetermined ~~range~~ number of lines of image data taken from is made maximum.

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Claim 10 (Original): The method of claim 7, wherein the picture elements in the predetermined range of the photoelectric transducer are optical black picture elements of the photoelectric transducer.

Claim 11 (New): An image reading apparatus comprising:

a photoelectric transducer configured to read an image of a document and to output an analog image signal;

an A/D converter configured to input the analog image signal and output a corresponding digital image signal;

an offset level detecting circuit configured to seek an average value of output levels from picture elements in a predetermined range of the photoelectric transducer;

an offset setting unit configured to provide an offset in the analog image signal before the A/D conversion on the basis of the average value;

a first comparing device configured to compare the average value to a predetermined target value; and

an adjusting device configured to adjust a size of the predetermined range of the photoelectric transducer on the basis of a result of the comparison,

wherein the adjusting device enlarges the predetermined range of the photoelectric transducer when a difference between the average value and the target value is smaller than a predetermined value, and

wherein the first comparing device comprises a second comparing device configured to compare the difference between the average value and the target value to a first predetermined value which is previously set, and a third comparing device configured to compare the difference to a second predetermined value which is previously set and which is smaller than the first predetermined value,

and further wherein, the adjusting device repeats the adjustment until the second comparing device judges that the difference is less than the first predetermined value, and when the difference is less than the first predetermined value, the predetermined range of the photoelectric transducer is made a maximum, and the third comparing device compares the difference to the second predetermined value after the predetermined range is made maximum.

Claim 12 (New): The image reading apparatus of claim 11, wherein the picture elements in the predetermined range of the photoelectric transducer are optical black picture elements of the photoelectric transducer.

Claim 13 (New): A method of image reading, comprising:  
reading an image of a document and outputting an analog image signal with a photoelectric transducer;

converting the analog signal to a digital image signal.

seeking an average value of output levels from picture elements of a predetermined range of the photoelectric transducer;

setting offset in the analog image signal before the A/D conversion on the basis of the average value;

comparing the average value to a predetermined target value as a first comparing; and

adjusting a size of the predetermined range of the photoelectric transducer on the basis of a result of the comparison,

Q2 wherein the adjusting comprises adjusting the predetermined range of the photoelectric transducer to be larger when a difference between the average value and the target value is smaller than a predetermine value, and

wherein the comparing includes a comparing the difference between the average value and the target value to a first predetermined value which is previously set as a second comparing, and a comparing the difference to a second predetermined value which is previously set and is smaller than the first predetermined value as a third comparing,

and further wherein, the adjusting repeats the adjustment until the second comparing judges that the difference is less than the first predetermined value, and when the difference is less than the first predetermined value, the predetermined range of the photoelectric transducer is made a maximum, and the third comparing compares the difference to the second predetermined value after the predetermined range is made.

Claim 14 (New): The method of claim 13, wherein the picture elements in the predetermined range of the photoelectric transducer are optical black picture elements of the photoelectric transducer.